

November 1, 2018

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California State Lands Commission  
100 Howe Avenue, Suite 100-South  
Sacramento, California 95825

***Subject: Underwater Cultural Resources Investigation Report for the Wheeler North Reef Expansion Project, City of San Clemente, California***

Dear Ms. Mongano:

This letter report documents the underwater cultural resources study conducted by Dudek for the proposed Wheeler North Reef (WNR) Expansion Project (proposed project). The California State Lands Commission (Commission) oversees management of State tidelands, and is the lead agency responsible for compliance with the California Environmental Quality Act (CEQA). A previous cultural resources inventory was completed by Petra Resource Management for the proposed project. This study included a review of a previously conducted records search at the South Central Coastal Information Center (SCCIC), review of a previously conducted Native American Heritage Commission (NAHC) Sacred Lands File search, and a reconnaissance survey of selected areas of the Area of Potential Effect (APE).

Pursuant to Assembly Bill 52 (AB 52), the Commission notified all 29 NAHC-listed Native American representatives of the proposed project through distribution of the Notice of Preparation (NOP) in January 2018. Representatives of the Juaneño Band of Mission Indians, Acjachemen Nation, notably Mr. Steven Villa, having responded with a request for government-to-government consultation regarding the project, expressed concerns that the project site had potential to contain tribal cultural resources (TCRs) and/or archaeological resources of Native American origin that were inundated through sea-level rise since prehistoric habitation of this area. TCRs (as defined in Public Resources Code § 21074) have tangible, geographically defined properties, and are most commonly comprised of archaeological resources that are presently listed or eligible for listing on the California Register of Historical Resources (CRHR), or as otherwise determined by the lead agency based on substantial evidence. Mr. Villa requested additional investigation, including an underwater reconnaissance of areas considered to have the highest potential to support the presence of such resources. Dudek was retained to complete this underwater cultural resources investigation in cooperation with Mr. Villa of NDNA Monitoring

and Consulting, LLC (NDNA) based on their understanding of local archaeological resources, experience in the management of TCRs, and qualified marine archaeological staff. The present report documents the results of underwater cultural resources and TCR investigations conducted by NDNA and Dudek in accordance with the standards and guidelines defined by the California Office of Historic Preservation (OHP) and CEQA.

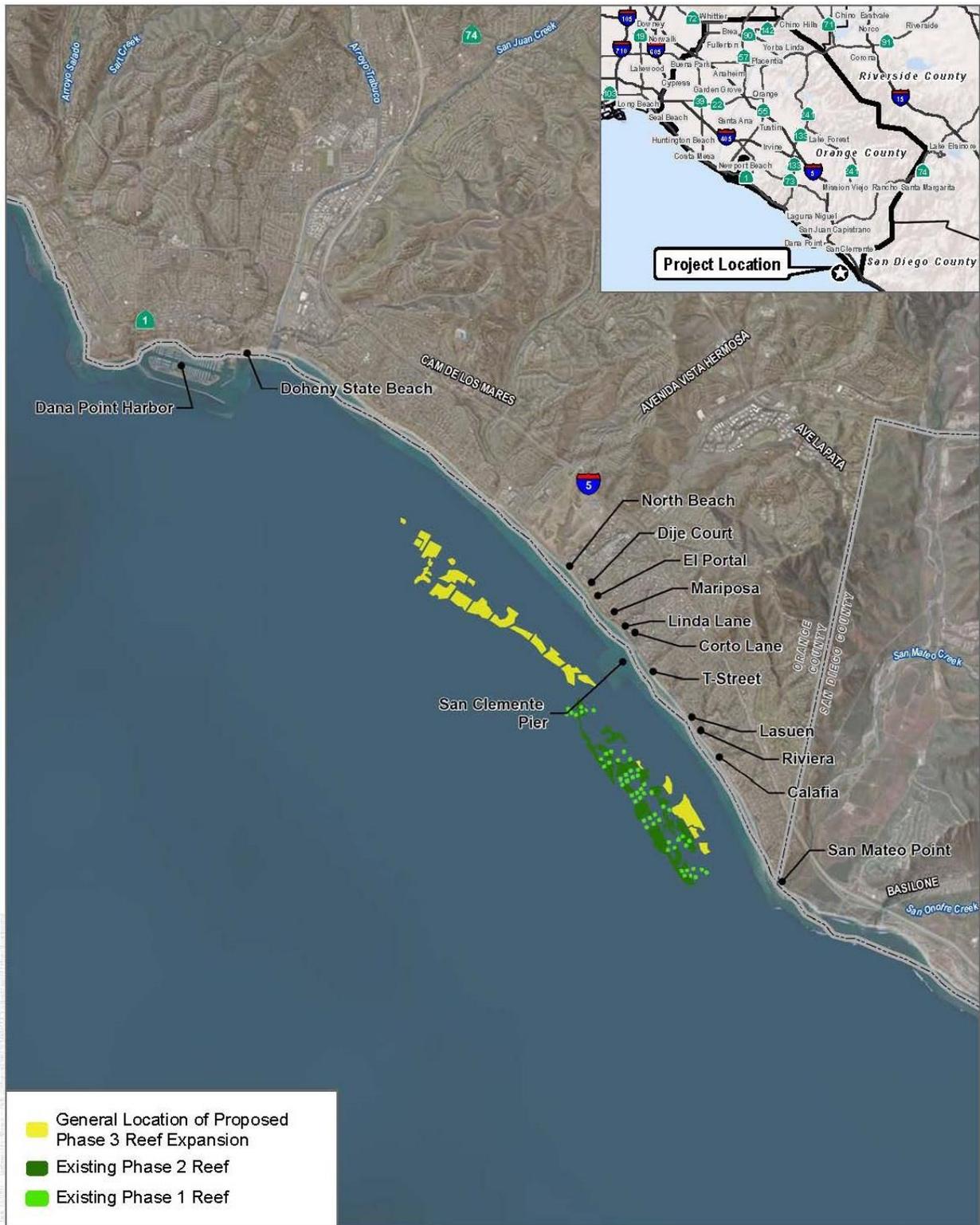
Marine archaeologist William Burns, MSc, RPA, completed fieldwork, prepared the present report, and acted as archaeological principal investigator. Adam Giacinto, MA, RPA and Micah Hale, PhD, RPA, assisted with project management and report preparation, as well as reviewed findings for regulatory compliance. All investigators meet Secretary of the Interior Standards for archaeology.

## **PROJECT LOCATION AND DESCRIPTION**

The proposed project would expand the existing 174 acre Wheeler North Reef by creating approximately 200 additional acres of kelp reef. The project is referred to as Phase 3 of the WNR and is located on submerged lands owned by the State of California and administered by the California State Lands Commission (CSLC). Using lessons learned during Phase 1 (Experimental Reef) and Phase 2 (Mitigation Reef), Phase 3 would create additional mitigation acreage by placing 150,000 tons of quarried rock in a low-relief fashion in 23 new polygons adjacent to the existing WNR. This project area is located in the San Clemente, California 7.5' USGS Quadrangle map and the San Pedro Channel; Dana Point Harbor and Gulf of Santa Catalina; Delmar Boat Basin-Camp Pendleton NOAA coastal charts. The approximately 200-acre project site is located approximately 1 mile west of the coastline off the city of San Clemente (Figures 1 and 2). The project area is located in between 30 and 50 feet of water. This cultural resources study evaluates impacts to cultural resources associated with development of the 200-acre.

The National Register of Historic Places (NRHP) is the United States' official list of districts, sites, buildings, structures, and objects worthy of preservation. Overseen by the National Park Service (NPS), under the U.S. Department of the Interior, the NRHP was authorized under the NHPA, as amended. Its listings encompass all National Historic Landmarks, as well as historic areas administered by NPS.

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SOURCE: Bing 2018



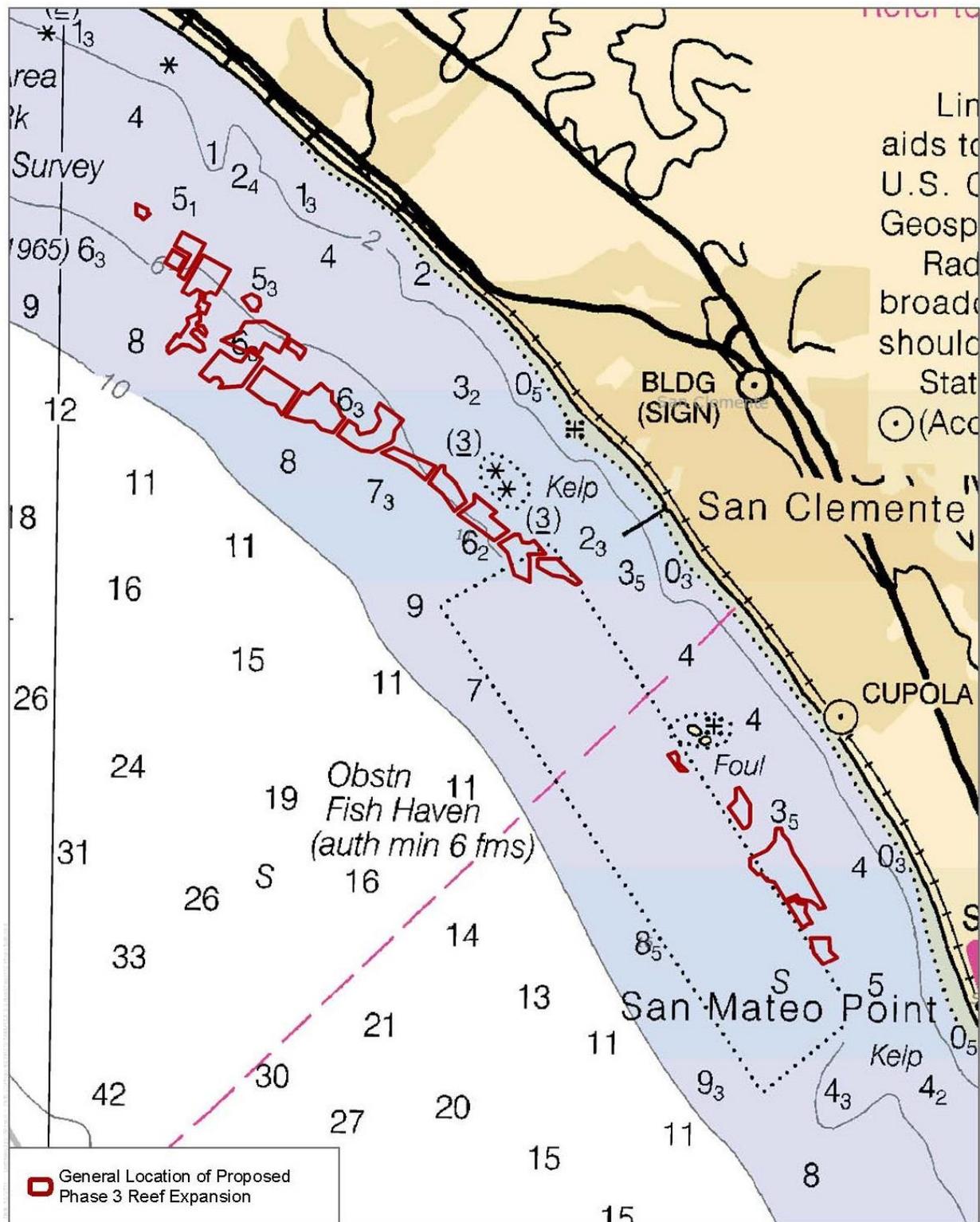
**FIGURE 1**  
Project Location  
Wheeler North Reef SEIR

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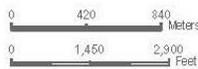
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SOURCE: NOAA 2018

**DUDEK**



**FIGURE 2**

Project Site

Wheeler North Reef SEIR

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## **REGULATORY FRAMEWORK**

### **National Register of Historic Places**

As there is a potential U.S. Army Corps of Engineers (USACE) review for this project, federal regulatory conditions stipulated by the National Historic Preservation Act (NHPA) are included here.

NRHP guidelines for the evaluation of historic significance were developed to be flexible and to recognize the accomplishments of all who have made significant contributions to the nation's history and heritage. Its criteria are designed to guide state and local governments, federal agencies, and others in evaluating potential entries in the NRHP. For a property to be listed in or determined eligible for listing, it must be demonstrated to possess integrity and to meet at least one of the following criteria:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. That are associated with the lives of persons significant in our past; or
- C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. That have yielded, or may be likely to yield, information important in prehistory or history.

Integrity is defined in NRHP guidance, *How to Apply the National Register Criteria*, as “the ability of a property to convey its significance. To be listed in the NRHP, a property must not only be shown to be significant under the NRHP criteria, but it also must have integrity” (NPS 1990). NRHP guidance further asserts that properties be completed at least 50 years ago to be considered for eligibility. Properties completed fewer than 50 years before evaluation must be proven to be “exceptionally important” (criteria consideration G) to be considered for listing.

## **State Regulations**

### ***The California Register of Historical Resources (Public Resources Code Section 5020 et seq.)***

In California, the term "historical resource" includes but is not limited to "any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California." (PRC Section 5020.1(j)). In 1992, the California legislature established the California Register of Historical Resources (CRHR) "to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change." (PRC section 5024.1(a).) The criteria for listing resources on the CRHR were expressly developed to be in accordance with previously established criteria developed for listing in the National Register of Historic Places (NRHP), enumerated below. According to PRC Section 5024.1(c)(1–4), a resource is considered historically significant if it (i) retains "substantial integrity," and (ii) meets at least one of the following criteria:

- (1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
- (2) Is associated with the lives of persons important in our past.
- (3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
- (4) Has yielded, or may be likely to yield, information important in prehistory or history.

In order to understand the historic importance of a resource, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource less than fifty years old may be considered for listing in the CRHR if it can be demonstrated that sufficient time has passed to understand its historical importance (see Cal. Code Regs., tit. 14, Section 4852(d)(2)).

The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP and properties listed or formally designated as eligible for listing in the NRHP are automatically listed in the CRHR, as are the state landmarks and points of interest. The CRHR also includes

properties designated under local ordinances or identified through local historical resource surveys.

### **California Environmental Quality Act**

As described further below, the following CEQA statutes and CEQA Guidelines are of relevance to the analysis of archaeological, historic, and tribal cultural resources:

- PRC Section 21083.2(g) defines “unique archaeological resource.”
- PRC Section 21084.1 and CEQA Guidelines Section 15064.5(a) defines “historical resources.” In addition, CEQA Guidelines Section 15064.5(b) defines the phrase “substantial adverse change in the significance of an historical resource;” it also defines the circumstances when a project would materially impair the significance of an historical resource.
- PRC Section 21074(a) defines “tribal cultural resources.”
- PRC Section 5097.98 and CEQA Guidelines Section 15064.5(e): Set forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony.
- PRC Sections 21083.2(b)-(c) and CEQA Guidelines Section 15126.4: Provide information regarding the mitigation framework for archaeological and historic resources, including examples of preservation-in-place mitigation measures; preservation-in-place is the preferred manner of mitigating impacts to significant archaeological sites because it maintains the relationship between artifacts and the archaeological context, and may also help avoid conflict with religious or cultural values of groups associated with the archaeological site(s).

More specifically, under CEQA, a project may have a significant effect on the environment if it may cause "a substantial adverse change in the significance of an historical resource." (PRC Section 21084.1; CEQA Guidelines Section 15064.5(b)). If a site is either listed or eligible for listing in the CRHR, or if it is included in a local register of historic resources, or identified as significant in a historical resources survey (meeting the requirements of PRC Section 5024.1(q)), it is a "historical resource" and is presumed to be historically or culturally significant for purposes of CEQA. (PRC Section 21084.1; CEQA Guidelines Section 15064.5(a)). The lead agency is not precluded from determining that a resource is a historical resource even if it does not fall within this presumption. (PRC Section 21084.1; CEQA Guidelines Section 15064.5(a)).

A "substantial adverse change in the significance of an historical resource" reflecting a significant effect under CEQA means "physical demolition, destruction, relocation, or alteration

of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (CEQA Guidelines Section 15064.5(b)(1); PRC Section 5020.1(q). In turn, the significance of an historical resource is materially impaired when a project:

- (1) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register; or
- (2) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to Section 5020.1(k) of the PRC or its identification in an historical resources survey meeting the requirements of Section 5024.1(g) of the PRC, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
- (3) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register as determined by a lead agency for purposes of CEQA (CEQA Guidelines Section 15064.5(b)(2)).

Pursuant to these sections, the CEQA inquiry begins with evaluating whether a project site contains any "historical resources," then evaluates whether that project will cause a substantial adverse change in the significance of a historical resource such that the resource's historical significance is materially impaired.

If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that they cannot be left undisturbed, mitigation measures are required (PRC Section 21083.2[a], [b], and [c]).

PRC Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- (1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

- (2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- (3) Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Impacts to non-unique archaeological resources are generally not considered a significant environmental impact (PRC Section 21083.2(a); CEQA Guidelines Section 15064.5(c)(4)). However, if a non-unique archaeological resource qualifies as tribal cultural resource (PRC Sections 21074(c); 21083.2(h)), further consideration of significant impacts is required.

CEQA Guidelines Section 15064.5 assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. As described below, these procedures are detailed in PRC Section 5097.98.

### **California State Assembly Bill 52**

Assembly Bill (AB) 52 of 2014 amended PRC Section 5097.94 and added PRC Sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3. AB 52 established that Tribal Cultural Resources (TCR) must be considered under CEQA and also provided for additional Native American consultation requirements for the lead agency. Section 21074 describes a TCR as a site, feature, place, cultural landscape, sacred place, or object that is considered of cultural value to a California Native American Tribe, defined at PRC Section 21073. A TCR is either:

- On the California Register of Historical Resources or a local historic register;
- Eligible for the California Register of Historical Resources or a local historic register; or
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1.

AB 52 formalized the lead agency–tribal consultation process, requiring the lead agency to initiate consultation with California Native American groups that are traditionally and culturally affiliated with the project, including tribes that may not be federally recognized. PRC Section 21080.3.1 defines consultation, with a cross-reference to Government Code Section 65352.4, as “the meaningful and timely process of seeking, discussing, and considering carefully the views of others, in a manner that is cognizant of all parties' cultural values and, where feasible, seeking agreement. Consultation between government agencies and Native American tribes shall be conducted in a way that is mutually respectful of each party's sovereignty. Consultation shall also

recognize the tribes' potential needs for confidentiality with respect to places that have traditional tribal cultural significance.” Lead agencies are required to begin consultation prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report. (PRC Section 21080.3.1[b]). The lead agency may not certify an environmental impact report or adopt a mitigated negative declaration for a project with a significant impact on an identified tribal cultural resource until the consultation process has been conducted. (PRC Section 21082.3[d]).

PRC Section 21084.2 states, “A project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment.” Effects on tribal cultural resources should be considered under CEQA. Section 6 of AB 52 added Section 21080.3.2 to the PRC, which states that parties to consultation may propose mitigation measures “capable of avoiding or substantially lessening potential significant impacts to a tribal cultural resource or alternatives that would avoid significant impacts to a tribal cultural resource.” Further, if a California Native American tribe requests consultation regarding project alternatives, mitigation measures, or significant effects to tribal cultural resources, the consultation shall include those topics (PRC Section 21080.3.2[a]). The environmental document and the mitigation monitoring and reporting program (where applicable) shall include any mitigation measures that are agreed upon during consultation. (PRC Section 21082.3[a]).

### ***Native American Historic Cultural Sites (PRC Section 5097 et seq.)***

State law addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, or inadvertent destruction; establishes procedures to be implemented if Native American skeletal remains are discovered during construction of a project; and establishes the Heritage Commission to resolve disputes regarding the disposition of such remains. In addition, the Native American Historic Resource Protection Act makes it a misdemeanor punishable by up to 1 year in jail to deface or destroy an Indian historic or cultural site that is listed or may be eligible for listing in the CRHR.

### ***California Health and Safety Code Section 7050.5***

California law protects Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. Health and Safety Code Section 7050.5 requires that if human remains are discovered in any place other than a dedicated cemetery, no further disturbance or excavation of the site or nearby area reasonably suspected to contain human remains shall occur until the County coroner has examined the remains (Section 7050.5b). PRC Section 5097.98 also outlines the process to be followed in the event that remains are discovered. If the coroner determines or has reason to

believe the remains are those of a Native American, the coroner must contact the California Native American Heritage Commission (NAHC) within 24 hours (Section 7050.5c). The NAHC will notify the Most Likely Descendant. With the permission of the landowner, the Most Likely Descendant may inspect the site of discovery. The inspection must be completed within 48 hours of notification of the Most Likely Descendant by the NAHC. The Most Likely Descendant may recommend means of treating or disposing of, with appropriate dignity, the human remains and items associated with Native Americans.

## **BACKGROUND RESEARCH**

### **Records Search Results**

A records search was completed for the current project area and a half-mile buffer around the project area by Petra Resource Management staff at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton on January 10, 2018. This search included a review of their collection of mapped prehistoric, historical, and built-environment resources, Department of Parks and Recreation (DPR) Site Records, technical reports, historical maps, and local inventories. Additional consulted sources included the NRHP, California Inventory of Historical Resources/CRHR and listed OHP Archaeological Determinations of Eligibility.

### ***Previously Conducted Studies***

SCCIC records indicate that two (2) previous cultural resources technical investigations have been conducted within one-half mile of the proposed project area (Table 1). Of these studies, none included any portion of the project site.

**Table 1**  
**Previous Technical Studies**

<b>Report Number</b>	<b>Date</b>	<b>Title</b>	<b>Author</b>
<i>Previous Studies that Included the Project APE</i>			
No previously recorded reports			
<b>Previous Studies Conducted within the One-Half Mile Search Area</b>			
OR-01968	1977	Field Inspection Report, San Clemente Municipal Pier	Moffatt & Nichol, Engineers
OR-04082	1987	California Outer Continental Shelf, Archaeological Resource Study: Morro Bay to Mexican Border, Final Report	Pierson, Larry, Shiner, Gerald, and Slater, Richard

### **Previously Identified Cultural Resources**

The SCCIC record search failed to identify any previously identified cultural resources within the project site or within one half-mile of the project area.

### **Prehistoric Coastline and Sea Level Rise**

The sea level has not been as it is today, nor has the coastline. The largest contributor to sea level change is the growth and melting of glaciers. As the sea level drops, wide areas of the continental shelf become exposed and as sea level rises, these lands become inundated. The last glaciation produced a drop that began 24,000 years ago before reaching a maximum of around 130 meters below present sea level 15,000 to 18,000 years before the present (BP). Afterwards there was a rapid rise in sea level until around 8,000 BP at which point the rise continued but greatly slowed (van Andel 1989; Lambeck 1996). This could, depending on the continental shelf of the particular area, change the coastlines a great deal by widening the exposed landmasses.

Pleistocene and Holocene sea level change has been estimated by previous studies of ice cores and deep sea cores which contain two oxygen isotopes:  $O^{16}$  and  $O^{18}$  (Chappell and Shackleton 1986; Fairbanks 1990; O'Brien et al. 1995).  $O^{16}$ , the lighter isotope, rises to the ocean surface and evaporates more easily than  $O^{18}$ . As glaciations occur, water evaporates from the ocean, enters the atmosphere, and falls as snow on the glaciers. This falling snow has a higher ratio of  $O^{16}$  and so more  $O^{16}$  becomes trapped in the glaciers than  $O^{18}$ . One can then measure the ratio of  $O^{16}$  to  $O^{18}$  in the ocean at a given time with deep sea cores, and then infer how much water was trapped in glaciers by comparing the two cores. The amount of water trapped in glaciers will indicate amount of water remaining in the oceans, and thus the sea level at a given time observed in the cores. Globally, the rise in sea level is summarized in Table 3:

**Table 3\***  
**Global Sea Level Rise**

<b>Years Before Present (BP)</b>	<b>Surface Depths Below Present Surface (1 fathom = 6 feet)</b>
12,000	-61.5 m or -33.6 fathoms
10,000	-34 m or -18.6 fathoms
9,000	-25 m or -13.7 fathoms
7,500	-15 m or -8.2 fathoms

\*Fairbanks 1990, as adapted and cited in Porcasi, Porcasi, and O'Neill 2001

The current project area lies between 50 to 30 feet (8 to 5 fathoms) of water according to NOAA Nautical Chart No. 18774. By these tables and using the depths from NOAA Chart No. 18774, it can be generally estimated that the project area was inundated after 7,500 BP. Current seafloor contours are fairly parallel to the current shoreline and it would appear the ancient coastline would not have appeared much different in shape from the current California bight coastline. However, it should be noted the siltstone geology observed during the cultural survey is extremely weak and may have been drastically altered from thousands of years of wave action and weathering. It should be further observed that paleocoastline reconstruction is an immensely complicated process with many variables, including tectonic movements, isostatic rebound, and rates of uplift from sea water weight, not taken into account within this study. In addition, the amount of rise and fall in the sea levels would not be equal on all parts of the globe. The changing distribution of ice and water masses alters the local gravity causing the seas themselves to readjust (Lambeck 1996; Williams *et al.* 1998). However, Southern California, far from the massive North American ice sheets of the Late Pleistocene, did not have the extreme isostatic rebound of the northern portions of North America. Generally sea level change on the southern California coast has not had the immensity of change seen on other parts of the globe in the past 12,000 years (Porcasi, Porcasi, and O'Neill 2001).

Southern California has been subject to substantial climatic change since the height of the last glaciation. The glaciers reached a maximum 30,000 BP to 18,000 BP and began to thin and retreat between 16,000 BP and 11,000 BP, with a brief re-advance during the Younger Dryas event, approximately 12,500 BP (Dawson 1992). During the early Holocene in southern California, the wet winters of the Pleistocene would have subsided and been replaced with intensified summer monsoons due to a shifted jet stream, creating conditions wetter than present day California (Minnich 2007). This wetter climate persisted into the mid-Holocene (5000 BP to 3500 BP) (Davis 1992). Pollen cores taken from both San Francisco Bay and Newport Bay indicate high intrusions of freshwater at during this time, suggesting higher rainfall (Davis 1992; Benson, Meyers and Spence 1991). This period resulted in greater deposition of alluvial sediments along drainages and off of the coast. By the Late Holocene the climate would have shifted to the more arid Mediterranean climate of the present (Minnich 2007). Prior to 7,500 BP, when the current project area was above sea level, conditions would have been considerably wetter than conditions today and would likely have more freshwater drainages currently on the coast due to the additional rainfall. With the added freshwater, the exposed coastal plains would have become areas of high biomass productivity. More biomass, a percentage of which would have been usable food resources, and the likelihood of finding freshwater would have made the area attractive to humans.

## **Geoarchaeological Summary**

The geology of the project site has been well documented within the Final Program Environmental Impact Report for the Construction and Management of an Artificial Reef in the Pacific Ocean Near San Clemente, California (CSLC 1999) and is reprinted in the two paragraphs below. The underlying geology of the project area consists of the San Onofre Shelf portion of the California Continental Borderland. The San Onofre Shelf between Dana Point and Oceanside, California, is about 3 to 5 miles wide and extends seaward to a depth of about 295 feet. Most of the bedrock underlying the Project area and exposed along the seafloor in the Project vicinity is thought to be Capistrano Formation (Eco-M 1997, as cited in CSLC 1999). The Capistrano Formation is Late Miocene and Early Pliocene in age (McNey 1979, as cited in CSLC 1999) and consists of dark gray and light gray siltstone and clayey siltstone with scattered and interbedded layers of sandstone tuff and diatomite. Concretions can be found within the clayey siltstone. Stratigraphic deformation of the Capistrano beds varies from tightly folded and sheared in the San Onofre bluff area to gently undulating with a westerly dip near San Mateo Point (Eco-M 1997, as cited in CSLC 1999).

Approximately 25 percent of the bottom in the area offshore of San Clemente that encompasses the Commission lease site (of which the current project area is within) consists of exposed bedrock (CSLC 1999). About five percent of this area is exposed cobble and the remaining 70 percent is covered by a thin veneer of fine sand and silt (Anderson et al. 1995, as cited in CSLC 1999). An unconsolidated hard cobble surface underlies the sand veneer (Eco-M 1997, as cited in CSLC 1999). The patches of fine sand are generally less than two feet thick. The proposed lease site consists of about 96 percent sand cover, generally less than one foot in thickness (SCE 1997, as cited in CSLC 1999).

## **Underwater Sites of Southern California**

While not common, other underwater prehistoric archaeological sites have been discovered in southern California. A review of these sites can help indicate the optimal seafloor conditions where intact resources may be discovered. P-37-000001 and P-37-000002 are both located off the coast of La Jolla and are collections of artifacts found up to 100 feet of water, and up to a half-mile offshore. Mostly mortars, these artifacts have been discovered primarily by recreational divers and it is unclear whether there is an intact site with archaeological deposits, or if the finds are out of context from surge action. P-37-013731 is located 30 miles south of the project area partially on a cliff and partially in the water. Numerous prehistoric mortars were located in both the eroding cliff and the water below. The submerged portion of the site appears to have been created by wave erosion removing artifacts from the cliff over time, meaning the artifacts are out of context. P-37-033563, located near P-37-013731, is an isolated mortar fragment found in spoil

piles from an offshore borrow site 730 meters off the coast of Cardiff State Beach. The water depths of the borrow site range from 39 to 69 feet. While local underwater sites indicate the coastal plain was an attractive area for early humans, none appear to be intact, displaying the destructive force of rising sea levels on archaeological resources.

## **METHODS AND RESULTS**

### **Underwater Reconnaissance Survey**

As part of AB 52 consultation, representatives of Acjachemen Nation of Juaneño Band of Mission Indians raised concerns that their oral history references village sites possibly within the project site, which had been inundated millennia ago through post-glacial sea level rise. To investigate the possibility of potential TCRs and cultural resources within the project area, the Acjachemen Nation requested an archaeological reconnaissance survey of portions of the project area. Using side scan sonar images, Steven Villa of NDNA Monitoring and Consulting, LLC, and Dudek marine archaeologist William Burns, MSC, RPA, identified ten project area polygons, which appeared to have geology of interest that could hold bedrock milling sites, rock shelters, or other possible archaeological resources. The Acjachemen Nation and Commission agreed to perform archaeological survey on portions of these ten polygons. The intent of Dudek's and NDNA's efforts was to identify and document any observed cultural resources and to appropriately assess the potential for the APE to support the presence of unanticipated cultural resources. As TCRs are identified through the process of consultation with the lead agency based on a tribe's traditional knowledge, Mr. Villa and Acjachemen Nation representative Gabriel Lopez provided additional expertise in this resource type.

Eighteen dives were performed by William Burns and Gabriel Lopez within the ten polygons of interest (Table 2) over nine days of fieldwork during August 2018. One to two points within each polygon were selected near areas with geologic and topographic potential as dive points. Divers would descend on these points and then survey on transects at cardinal directions using compasses and tape measure/trail line reels. Divers kept parallel to each other on transects using a twenty foot 'buddy line' between them.

**Table 2**  
**Archaeological Survey Areas**

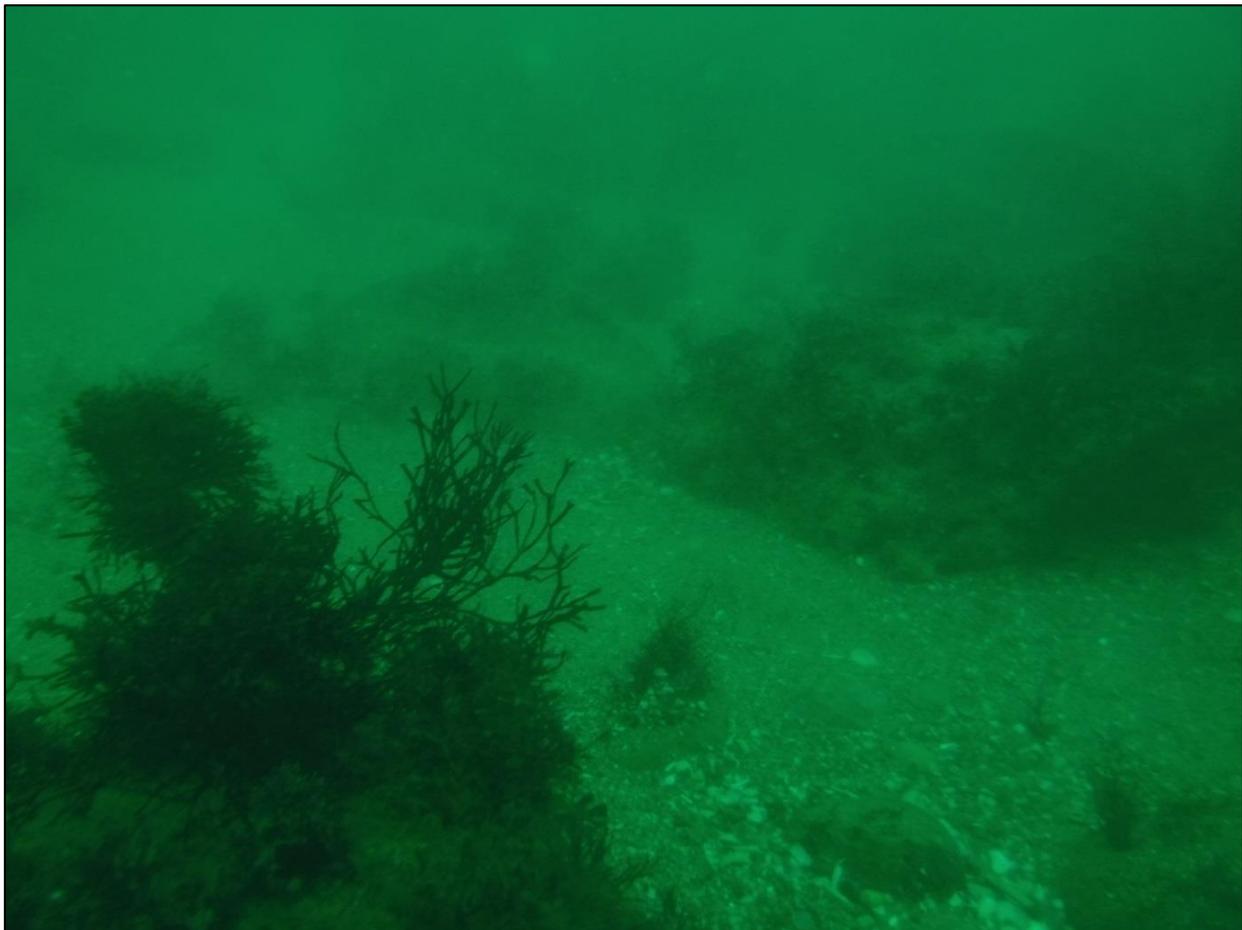
<b>Survey Area</b>	<b>UTM mE</b>	<b>UTM mN</b>	<b>UTM mE (2nd locus)</b>	<b>UTM mN (2nd locus)</b>
21	442896	3695745		
22	442428	3696137		
25	441103	3697758	441072	3697892

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Survey Area	UTM mE	UTM mN	UTM mE (2nd locus)	UTM mN (2nd locus)
27	440609	3698172	440388	3698369
29	439984	3698627		
30	439650	3698780		
31	439421	3699004		
32	439745	3699064		
33	439620	3699154	439187	3699124
35	438824	3699067	438805	3699074

Upon discovering areas with exposed geology, divers would visually and tactilely inspect the rocks for areas of bedrock milling or any other cultural features. A representative example of survey conditions and setting are provided in Figure 3 below.



**Figure 3: Survey Area 35, siltstone geology**

The surveys resulted in several items being identified. Objects identified during the survey include five glass bottles which were not of historic age, one .50 caliber cartridge casing of unknown age, one California cone snail shell with a hole drilled in the side (Figure 4), and an unusually shaped stone (Figure 5). It was not immediately clear whether the shell is drilled by a predatory gastropod or if it is a cultural artifact so it was brought up for further analysis. The hole does not pass through the entire shell and is consistent in shape and style of a predatory gastropod. Holes drilled by predatory gastropods possess a slight bevel terminating in a wide, flat-sided hole, while human drilled holes have a uniformly conical shape (Miller and Boxt 2009). Under a microscope the edges are rough as would be the case from the teeth of a gastropod's radula, unlike the smooth grinding created by a human drill. However, further inspection by Native representatives could reveal a cultural origin of the object.



**Figure 4: California cone snail shell**

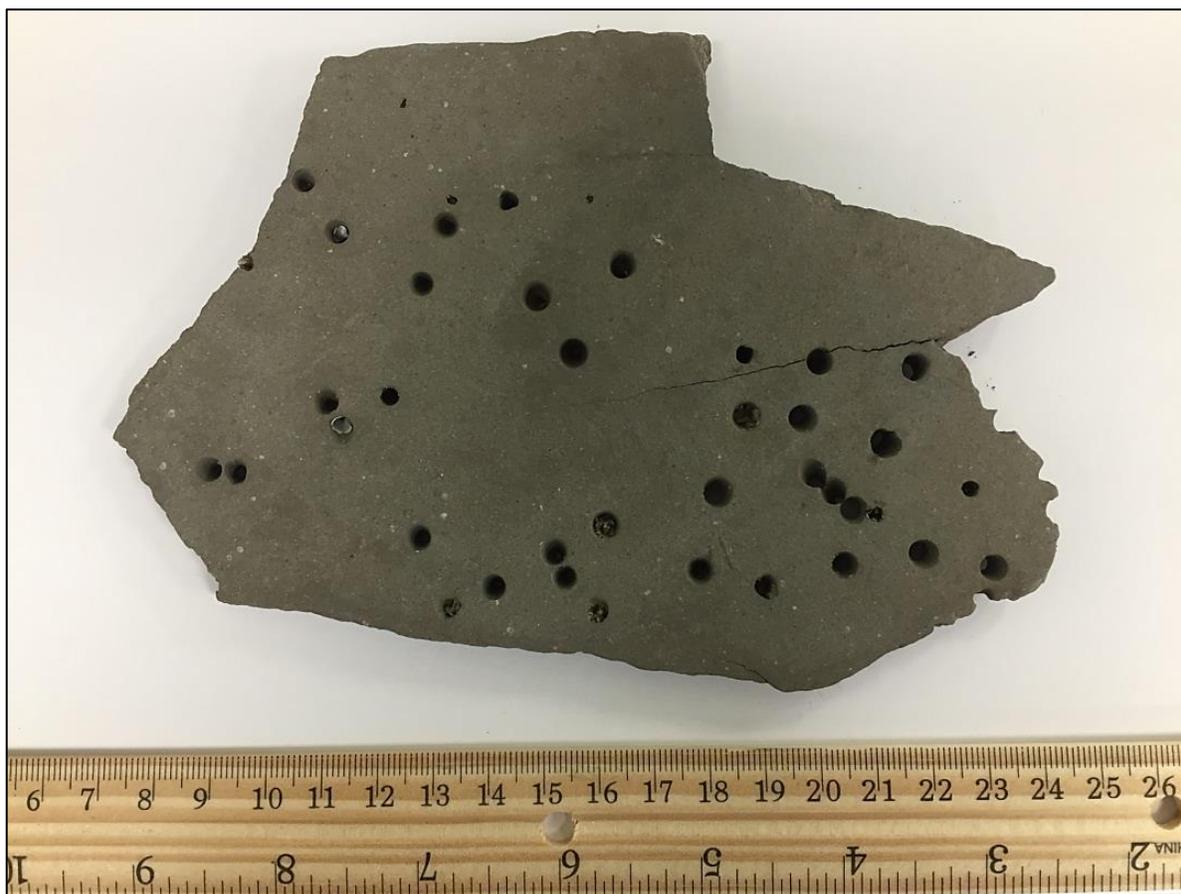
The unusually shaped stone was likewise collected for further identification. Dudek archaeologists inspected the stone under a microscope looking for signs of grinding, pecking, or other cultural modification. Instead of seeing ‘plateaus and valleys’ typical with human shaped items and groundstone, this stone demonstrates even smoothing across all surfaces of the rock. Uniform abrasion on all exposed surfaces commonly occurs in various types of aquatic environments. Underwater cobble abrasion has been discussed in an article written by Katherine Unger Baillie-Penn, titled “Why river rocks are round”, where first, natural water abrasion makes a rock round. Then, only when the rock is smooth, does the water abrasion act to make it smaller in diameter (Baillie-Penn 2014). Whereas with human-shaped groundstone artifacts, the action of human utilization of rock material determines the construction of the groundstone in specific patterns, namely patterns of design and manufacture. There are no notable human patterns seen with the stone object in question, only uniform even smoothing suggestive of natural water abrasion and weathering. However, as with the cone snail shell, further inspection by Native representatives could reveal a cultural origin of the object.



**Figure 5: Stone**

No tribal cultural resources were identified during the survey, pending confirmation from the Acjachemen Nation.

During these dives the seafloor geology was closely inspected for their potential to contain possible intact resources. Seafloor geology appeared to be predominantly sand shallowly underlain by siltstone bedrock exposed in certain areas. The siltstone degrades and breaks easily by hand and contains numerous holes from natural marine processes (Figure 6).



**Figure 6: Sample representative geology (siltstone) from Survey Area 35**

## **SUMMARY AND MANAGEMENT RECOMMENDATIONS**

### **Archaeological Resources**

Observation of the present conditions within the proposed project area indicates that all areas have been subject to a substantial degree of past disturbances related to wave processes from post glacial sea level rise. The thin layer of sand overlying siltstone bedrock would likely not be able to contain intact archaeological deposits due to the scouring of the rock from sea level rise

and the current dynamic seafloor environment. Geology observed during survey consisted of extremely weak siltstone which would be poor for use as bedrock milling sites. Other possible cultural features within the geology would have likely been exfoliated down by millennia of wave action on the weak stone. No newly identified tribal cultural resources were recorded during the reconnaissance survey of the project area, pending confirmation from the Acjachemen Nation. Further, a SCCIC records search did not identify the presence of cultural resources within the proposed project area. The project, as currently designed, appears to have a low potential for impacting any undiscovered cultural resources. Based on these negative findings and the observed conditions of the present project area, no additional cultural resources efforts are recommended to be necessary beyond standard protection measures for unanticipated discoveries of cultural resources and human remains.

### ***Unanticipated Discovery of Archaeological Resources***

In the event that archaeological resources (sites, features, or artifacts) are exposed during construction activities for the proposed project, all construction work occurring within 100 feet of the find shall immediately stop until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, can evaluate the significance of the find and determine whether or not additional study is warranted. Depending upon the significance of the find under CEQA (14 CCR 15064.5(f); PRC Section 21082), the archaeologist may simply record the find and allow work to continue. If the discovery proves significant under CEQA, additional work such as preparation of an archaeological treatment plan, testing, or data recovery may be warranted.

### ***Unanticipated Discovery of Human Remains***

In accordance with Section 7050.5 of the California Health and Safety Code, if human remains are found, the County Coroner shall be immediately notified of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within 2 working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the County Coroner determines that the remains are, or are believed to be, Native American, he or she shall notify the NAHC in Sacramento within 24 hours. In accordance with California Public Resources Code, Section 5097.98, the NAHC must immediately notify those persons it believes to be the most likely descendent (MLD) from the deceased Native American. The MLD shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains.

*Subject: Underwater Cultural Resources Investigation Report for the Wheeler North Reef  
Expansion Project, City of San Clemente, California*

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If you have any questions about this report, please contact William Burns at [wburns@dudek.com](mailto:wburns@dudek.com).

Respectfully Submitted,

  
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